

**DR. LUIS VARGAS ON AMERICAN BLACK-FLIES
—A REVIEW, WITH CRITICAL
NOTES (DIPTERA).**

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Simúlidos del Nuevo Mundo. By Luis Vargas. (Monografía No. 1 of the Instituto de Salubridad y Enfermedades Tropicales, México, D.F. 1945.) vi + 241 pp.

The black-flies, or members of the family Simuliidae, are among the smallest of the blood-sucking Diptera, only a few species reaching one-fifth of an inch in length. Yet, owing to their large numbers and voracity, they rank among the most vicious pests of animals and man. In recent years interest in these insects has become more general, particularly because of their rôle in the transmission of human onchocerciasis. This disease, caused by a roundworm, *Onchocerca volvulus*, frequently induces partial or total blindness and is prevalent in parts of Tropical Africa, as well as in the prosperous coffee-growing districts of southern Mexico and Guatemala.

As the proposed Pan-American Highway traverses the infected area, there is real danger of the disease spreading to new territory, where black-flies are common but as yet free of infection. The Governments of Mexico and Guatemala are fully aware of the risk and are actively engaged in studying and combating the disease and its vectors. Dr. Luis Vargas, as the Mexican member of the Inter-American Committee for the Control of Onchocerciasis, has had considerable experience and is well qualified to present a comprehensive account of these insects. His Monograph is a well conceived and fully reliable guide for American students of the Simuliidae. About one-fourth of it is devoted to general topics, namely, the economic importance, particularly in relation to the health of man and animals, the external and internal morphology of the adult, the habits of the adults, oviposition, larval morphology, the bionomics of the early stages, the life span, rearing methods, and the various parasitic and predacious enemies. In addition to a digest of published data, these chapters include some new observations by the author and his Mexican associates. The excellent illustrations, many of them original, add greatly to the value of this account.

The remainder of the book is devoted to the taxonomy of the family. It starts with a critical study of various systems of classification proposed in recent years. To the taxonomist the Simu-

liidae present a rather unusual problem. To begin with, the family is sharply delimited, there being none of the annectant forms which only too often blur the dividing lines between the major groups of Diptera. The general morphology is unusually uniform at all stages, no doubt because the adult and larval habits are much the same throughout the family. The females of all species are obligate blood-suckers, so far as known, and the early stages are always rheophilous, that is, adapted to living immersed in swiftly flowing water. In addition, the species and races are relatively few, not more than about 600 having been recognized thus far. Finally, the specific characters of the adults are inconspicuous and are scarcely ever adaptive modifications of some more generalized structures. This latter peculiarity makes it difficult to define truly natural groups of species, corresponding to definite evolutionary trends.

In recent years Enderlein attempted to build up an ambitious "System" which divides the family into 7 subfamilies (some of these with a number of tribes) and 47 genera. Many of his genera are clearly based on artificial combinations of relatively unimportant features. Hence the reluctance of his contemporaries to accept his classification, most recent students being content to include all black-flies in the one genus *Simulium*. Nevertheless, it would seem that some of Enderlein's divisions are natural groups, as much entitled to generic rank as similar groups generally treated as genera in other families of Diptera. Some future student will have the difficult task of clarifying the taxonomy of the family. He will be greatly helped by Dr. Vargas' compilation of the supraspecific names proposed thus far. There appears to be no important omission in this part of the work. Perhaps the generic name *Simulia* Meigen (1818, Syst. Beschreib. Europ. Zweifl. Ins., 1, p. 289) should have been included. It was presumably an emendation of *Simulium* Latreille (1802), but it was also used by some later writers, notably by Zetterstedt.

It might be useful to note two generic names proposed for fossil flies, at one time believed to be Simuliidae. *Pseudosimulium* Handlirsch (1906, Die Fossilen Insekten, pt. 4, p. 631) was proposed for the fossil *Simulium* (?) *humidum* Brodie (1845) which is not a true black-fly. The name antedates *Pseudosimulium* Baranov, 1926, proposed for Recent species. *Simulidium* Westwood (1854, Quart. Jl. Geol. Soc., 10, p. 394) was based on *Simulidium priscum* Westwood, one of the Bibioniidae, according to Handlirsch.

In this connection, it may be mentioned that a few fossil true

Simuliidae are known, all from the Oligocene and mostly from Baltic amber. These extinct forms seem to be essentially like the Recent members of the family.

About half of Dr. Vargas' Monograph consists of a Catalogue of the 227 New World species and subspecies, in alphabetical sequence, with their synonyms and complete references to the literature. As the author includes all species in one genus, *Simulium*, he was obliged to propose new specific names when the same name had been used more than once by previous writers. Unfortunately, Dr. John Smart, of the British Museum, made similar changes in the nomenclature while Dr. Vargas' Monograph was being published. I have thought it useful to point out how this will affect the nomenclature of the American species. I have added some other comments and a few additions.

Simulium aequatoriense should be credited to Vargas, 1945, as Enderlein did not use that form of the name. Moreover, it is in my opinion an unnecessary emendation of *ecuadoriensis* Enderlein, 1934. Both forms of the specific name are acceptable according to the rules.

Simulium angustifrons (Enderlein, 1934). The species was named *Simulium lurjbayae* by Smart, 1944, Proc. Ent. Soc. London, Ser. B, 13, p. 132, because of the earlier *Nevermannia angustifrons* Enderlein, 1921, if the latter is transferred to *Simulium*.

Simulium chalcocomense should be credited to Vargas, 1945, not to Knab. It is, moreover, a superfluous emendation of *Simulium chalcocoma* Knab, 1914, a specific name which is correctly formed.

Under *Simulium chilianum* Rondani, the reference to *Simulium chilense* Philippi, 1865, should be deleted, as both are listed as distinct species in the Catalogue.

Simulium coffeae Vargas dates from 1945, Rev. Med. Trop. Paras. Habana, 11, p. 4. It was proposed unnecessarily as a new name for *Friesia falculata* Enderlein, 1929, which is not a homonym of *Wilhelmia falcula* Enderlein, 1921, even when both species are transferred to *Simulium*.

Simulium costarricense Vargas, 1945, Rev. Med. Trop. Paras. Habana, 11, p. 5, is antedated by *Simulium costaricense* Smart, 1944, Proc. Ent. Soc. London, Ser. B, 13, p. 132. Both names were proposed for *Acropogon rufidorsum* Enderlein, 1936.

Simulium glaucophthalmicum should be credited to Vargas, 1945, not to Knab. Whether or not this emendation of *Simulium glaucophthalmum* Knab, 1914, was necessary is a matter of opinion.

Simulium incaicum Vargas, 1945, Rev. Med. Trop. Paras.

Habana, 11, p. 4, is antedated by *Simulium sicuani* Smart, 1944, Proc. Ent. Soc. London, Ser. B, 13, p. 132. Both names were proposed for *Ectemnaspsis limbata* Enderlein, 1934.

Simulium paynei Vargas, 1942, has as synonym *Simulium bilimekæ* Smart, 1944, Proc. Ent. Soc. London, Ser. B, 13, p. 132. Both names were proposed for *Hemicnetha mexicana* Enderlein, 1945.

Simulium simile Silva Figueroa, 1917, has as synonym *Simulium figueroa* Smart, 1944, Proc. Ent. Soc. London, Ser. B, 13, p. 133. Smart proposed this new name unnecessarily, as there is no *Simulium simile* Malloch, 1914 (Malloch's name dates from 1919).

Simulium venustum var. *infuscatum* Ad. Lutz, 1909, and *Simulium infuscatum* Ad. Lutz, 1910, are two distinct species according to Ad. Lutz, 1917, Mem. Inst. Osw. Cruz, 9, p. 62. If this is true, the second in date will have to be renamed.

The following species should be deleted from the American Catalogue: *Simulium neireti* Roubaud, 1905, Bull. Mus. Paris, 11, p. 425. Originally described from Madagascar, it was recorded by Enderlein (1936) from Natal and Pretoria in South Africa.

The following American species were omitted from the Catalogue:

Simulium groenlandicum Enderlein, 1935, Sitzungsber. Ges. Naturf. Fr. Berlin, for 1934, p. 363. Greenland.

Psilozia groenlandica Enderlein, 1936, Sitzungsber. Ges. Naturf. Fr. Berlin, for 1936, p. 114. This was renamed *Simulium asakakæ* Smart, 1944, Proc. Ent. Soc. London, Ser. B, 13, p. 131. Greenland.

Simulia hematophila Laboulbène, 1882, Archives Médecine Navale, 38, p. 223, from Newfoundland, has been overlooked by all subsequent writers. Although described and clearly recognizable as one of the Simuliidae, it is perhaps only a hypothetical species, as Laboulbène saw no specimen. He wrote his description from notes made in the field by E. Treille (1882, *op. cit.*, p. 221), as well as from some unpublished sketches. This is said to be a very troublesome blood-sucker in Newfoundland and should be easily recognized from the description.

In a taxonomic Catalogue special attention should be paid to tracing the actual first date of publication of all names, so as to ensure the correct application of the rules of nomenclature. Dr. Vargas' dates are generally correct; but in a very few cases he was evidently unable to reach a decision. It may be helpful to complete his indications.

Simulium fulvum Coquillett, *S. glaucum* Coquillett and *S. vir-*

gatum Coquillett date, not from 1903, but from September 12, 1902, the date given for Coquillett's paper in the Table of Contents of vol. 25 of Proc. U. S. Nat. Mus.

Simulium molestum Harris was first published, with a description, in 1841, Report Insects Massachusetts Injurious to Vegetation, p. 405 (not in 1862). No locality was mentioned, but the types, in the Harris Collection now at the Museum of Comparative Zoölogy, are labelled "White Mountains, New Hampshire." The *Simulium nocivum*, also briefly described by Harris in 1841 (*op. cit.*, p. 405), is from the description a *Culicoides*. Both specific names are omitted from Sherborn's Index Animalium, although they are validly proposed. Compare C. W. Johnson's notes on the Harris Collection (1925, Proc. Boston Soc. Nat. Hist., 38, No. 2, pp. 62 and 65).

Simulium venustum Say dates from 1823 (not 1827).

Simulia vittata Zetterstedt was published in 1838 (not 1835, 1839, 1840, or 1844). The "Insecta Lapponica Descripta" appeared from 1837 to 1840, the title page, issued after completion of the work, bearing only the date 1840; but the part containing p. 803 was published in 1838. Moreover, the type locality was Greenland, the only locality definitely given. Lapland was added only with doubt.

Simulium nigrimana Macquart dates from 1838 (not 1837), both the original in Mém. Soc. R. Sci. Agric. Arts Lille (for 1838), pt. 2, p. 88, and the reprint, Diptères Exot. Nouv. Peu Connus, vol. 1, pt. 1, p. 84, being published that year. *Simulium tarsatum* Macquart was first published in 1845, Mém. Soc. R. Sci. Agric. Arts Lille (for 1844), p. 148. The reprint, "Diptères Exotiques Nouveaux ou peu Connus, Supplément I," which Dr. Vargas quotes (as p. 20), is dated 1846 on the title page.

All references to Enderlein's paper in the Deutsche Entom. Zeitschr. for 1933, pp. 273-292, should be dated as of 1934. Parts 2-3 of this volume appeared in February, 1934, as printed on the cover.

The extremely useful Index and the very full bibliography, which conclude Dr. Vargas' Monograph, are particularly to be commended.